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THE COMPARABLE UTILITY OF COMPUTED TOMOGRAPHY AND ECHOCARDIOGRAPHY IN THE DETECTION OF EARLY STAGE CALCIFIC AORTIC VALVE DISEASE: AN AGES-REYKJAVIK INVESTIGATION.

ACC Poster Contributions
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Background: Although echocardiography (echo) and computed tomography (CT) are complementary technologies for evaluating calcific aortic valve disease (CAVD), the relative utility of each for phenotyping early stage CAVD (i.e., aortic sclerosis) has not been evaluated previously.

Methods: The abilities of CT and echo to detect aortic sclerosis were compared in 743 members of the Age, Gene-Environment Susceptibility (AGES)-Reykjavik Study. Aortic sclerosis (ASc) was defined by CT as an aortic valve calcification (AVC) score >0, per Agatston method, and by echo as leaflet thickening or restricted leaflet motion. Inter-modality agreement was assessed using kappa coefficients, and the associative power of each modality assessed through backwards stepwise logistic regression.

Results: This AGES-Reykjavik sub-cohort was 53% female with a mean age of 76±5.7 years. The prevalence of ASc was significantly greater by CT-defined, as compared to echo-defined, criteria (46.7% vs. 35.4%, $p<0.0001$). A CT-based threshold of 30 Agatston units equalized prevalence of ASc at 35.4%. Although there was significant inter-modality agreement in classifying ASc (66.6%, ☒=0.032, $p<0.0001$), agreement was dependent on the severity of CAVD. When no calcium was detectable by CT, there was 79.3% agreement. In contrast, among tertiles of AVC scores (0-44, 44-190 and >190 Agatston units), agreement increased incrementally (32.2%, 44.8% and 79.3%, respectively). In backwards stepwise logistic regression of previously identified CAVD risk factors, echo-defined ASc was associated only with age ($p<0.001$, $z=5.4$) and male gender ($p<0.001$, $z=3.1$), whereas CT-defined ASc was associated not only with age ($p<0.001$, $z=8.2$) and male gender ($p<0.001$, $z=4.0$), but also with hypertension ($p=0.02$), and smoking ($p<0.001$).

Conclusions: While echocardiography and CT are complementary modalities for detecting CAVD, there is significant differential classification of disease, especially in its early stages. As compared to echo, CT is more sensitive for detecting risk associations and therefore may be the preferred modality for phenotyping CAVD in population-based investigations.